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A.D. 1837 . . . . N° 7463.

SPECIFICATION

OF

TOBIAS MICHELL.

APPARATUS FOR WASHING AND PURIFYING THE SMOKE AND VAPOURS ARISING FROM FURNACES.

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Apparatus for Washing and Purifying the Smoke and Vapours arising from Furnaces.

MICHELL'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, Tobias Michell, of Kingsland Green, in the County of Middlesex, Gentleman, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Seventh day of November, in the first year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Tobias Michell, Her especial license, full power, sole privilege and authority, that I, the said Tobias Michell, my executors, administrators, and assigns, or such others as I, the said Tobias Michell, my executors, administrators, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick upon Tweed, my Invention of "IMPROVEMENTS IN WASHING AND PURIFYING SMOKE AND VAPOURS EVOLVED FROM FURNACES OF VARIOUS DESCRIPTIONS;" in which said Letters Patent is contained a proviso that I, the said Tobias Michell, shall cause a particular description of the nature of my said Invention, and in what manner the same is to be performed, to be inrolled in Her said Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Tobias Michell, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed are particularly described and ascertained in and by the Drawing hereunto annexed, and the following description thereof, that is to say:—

My said improvements in washing or purifying smoke and vapours evolved from furnaces of various descriptions consist in the use or employment of machinery to cause an exhausting or propelling current or currents or both, whereby I compel the smoke or vapours evolved from furnaces to pass repeatedly through bodies of water, or water or other fluids impregnated with alcalies or other fit and proper substances, or through substances or through interstices between substances, whether moist or dry, and which are calculated to neutralize or decompose the acid or other noxious fumes evolved from furnaces, and particularly those furnaces which are employed in the smelting, calcination, or fusion of metallic ores, as also in the decomposition of common salt or muriate of soda or mineral alcali therefrom. And such machinery may be exhausting pumps actuated by the powers of wind, water, steam, or either first movers of machinery, or centrifugal exhausting machines, and either such as will be more particularly described herein, or any others possessed of sufficient powers to produce the desired effect. In the said Drawing, Figure 1 is a front view or elevation; Figure 2, an end view; and Figure 3, a plan or top view, of an exhausting or propelling apparatus, consisting of a series of vessels A, A, with pipes or tubes B, B, one end of each of which descends below the surface of the water or other fluid contained in the said vessels, whilst their other ends C, C, proceed from the upper part of the said vessels; these said vessels and pipes may be more or less numerous according as the smoke and vapours evolved from the furnaces require to be purified in a greater or lesser degree. The tube or pipe D conveys the smoke or vapours from the first vessel A into a valve box E, a plan of which is shown separately in Figure 4; upon the top of this valve box E two exhausting cylinders F, F, are mounted, and secured by flanches with screwed bolts and screwed nuts to them, and each cylinder is provided with a piston G, G, shewn by dotted lines in Figures 1 and 2, which fits rather loosely, so that it descends by its own weight at the same time that it fits as tightly in each cylinder as may be to allow of such descent. The tops of these cylinders are open, and lines or cords affixed to each piston are secured at their other ends to a cylinder, barrel, or drum H, Figures 1, 2, and 3, with a shaft or axis having necks or pivots turning in bearings with brasses to them, which are mounted firmly upon a platform secured upon the upper ends of the cylinders F, F, as shown in those Figures, and upon the said shaft or axis a toothed wheel or pinion I is affixed, as shewn in Figures 2 and 3, and by dotted lines in Figure 1, and in which a toothed rack J works backwards and forwards, and as impelled by the first moving power which actuates the machinery, and thus alternately raises and lowers the pistons. The smoke or vapours from the furnaces are brought by the pipe or tube B, Figures 1 and 3, which descends through the closely fitted cover of the vessel A, below the surface of the water or other fluid contained in the said vessel, where it is diffused or spread through the said water by means of a number of slender rods of wood or metal, which are affixed underneath the end of the said pipe or tube, they being mounted upon a disc or support which surrounds the aperture of the pipe. The smoke or vapours being thus once washed are conveyed through the pipe C, D, into a chamber E, of the valve box, from whence they pass through one of the valves K, K, shewn in Figures 2 and 4, into one of the pump cylinders F, whilst the piston is rising, and also into the other cylinder on its piston being raised. When the pistons are depressed the washed smoke or vapours are expelled through the valves L, L, and are either delivered into the external air or again propelled through other waters or fluids repeatedly, as their impurities may require. During the passage of the smoke or vapours through the water or other fluids they may also be compelled to pass underneath a series of horizontal combs or brushes M, M, M, Figures 5 and 6, which dip into the water or other fluids in the manner shown in Figure 5, which is a longitudinal section of a metal pipe or trough, and a transverse or cross section of which is shewn in Figure 6, and thereby become further purified, or they may be passed through other apparatus similar to that shewn in Figure 7, which is provided with a convenience whereby a specimen of the state of the process may be withdrawn occasionally for examination through the lower aperture of a vessel N, which is fitted with a closely shutting pan or dish O, and which is kept shut by means of the following contrivance:—The dish O is hung to a bent lever P, which is jointed to an arm affixed upon the vessel N. To the outer end of the bent lever P another bent lever Q is connected by means of a pin or stud which slides within a groove formed in one branch of the bent lever P; the bent lever Q has a hole made through its angular part, which is fitted upon a stud or pin affixed in the solid part R, hinges, as is shewn by the dotted lines in Figure 13, which is a plan of it shewn upon a smaller scale. This plan likewise exhibits the action of the wind by means of darts or arrows, shewing that when the large wind vane *i* is in the direction of the wind the quadrantal screen *j* shuts off its action entirely upon one half of the windmill, whilst nearly the whole of the other half of it is freely exposed to its action; but when the half of the screen is folded back, as shewn by the dotted lines in Figure 13, then the wind acting upon both sides of the windmill with equal powers, one to turn the mill and the other to oppose its motion, of course the mill remains at rest or immoveable, and in order to set it in motion again the screen must be again opened as at first. The frame carrying the screen *j* and large vane *i* swings around, and is supported upon the mill shaft *a*, *a*, in the following manner:—The upright standard *k*, to which the large vane is affixed, passes through the centre of the upper part of the frame downwards, and is made cylindrical and flat at its bottom, and is hardened. Within the upper end of the shaft *a*, *a*, a cylindrical hole is made to fit the cylindrical descending part of the standard *k*, and it has likewise a short cylinder of hard steel, having its upper surface made convex, fitted into the bottom of that hole, as shewn upon a larger scale in Figure 14, and upon which the flat bottom of the descending standard *k* rests, and is thus supported. To the lower central part of the frame there is also affixed by screwed bolts and nuts another metal socket *g*, similar to that before described, and which is received and turns in another cast iron oil cup *e*, with a socket made to fit it, which is fixed upon the mill shaft *a*, *a*, and within which it freely swings. The toothed spur wheel *c* above mentioned drives a pinion *l*, which is mounted upon another upright shaft or axis *m*, carrying a band wheel *n*, from which a band is passed to a smaller band wheel, similar to that shewn in Figure 9, to actuate the centrifugal fan or exhauster. The upper end of the shaft *m* is furnished with an oil cup and socket, similar to that described in the references to that Figure, into which a screwed cylindrical pivot with a lock bar is passed from the beam *f*, and its foot is made cylindrical and flat, and turns in an oil cup and socket, and rests upon a hard cylinder with a convex upper surface, mounted within the said oil cup, exactly in a similar manner with the upright shaft W, W, of Figure 9.

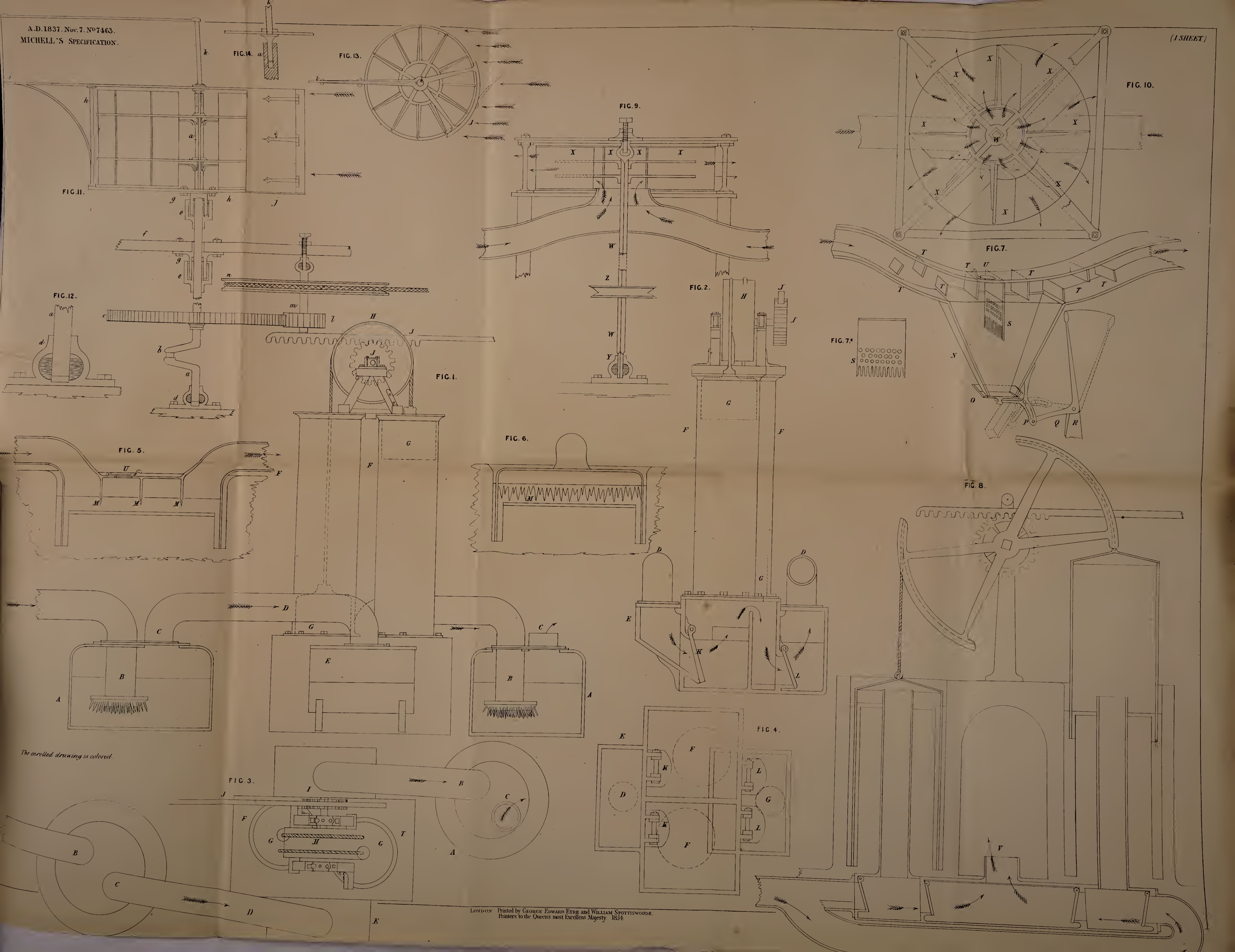
In witness whereof, I, the said Tobias Michell, have hereunto set my hand and seal, this Seventh day of May, One thousand eight hundred and thirty-eight.

TOBIAS (L.S.) MICHELL.

A.D. 1837. Nov. 7. No 7463.

MICHELL'S SPECIFICATION.

(1 SHEET)



The enrolled drawing is colored.

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AND BE IT REMEMBERED, that on the Seventh day of May, in the first year of the reign of Her Majesty Queen Victoria, the said Tobias Michell came before our said Lady the Queen in Her Chancery, and acknowledged the Instrument aforesaid, and all and everything therein contained and specified, in form above written. And also the Instrument aforesaid was stamped according to the tenor of the Statute made in the fifty-fifth year of the reign of His late Majesty King George the Third.

BROUGHAM.

Inrolled the Seventh day of May, One thousand eight hundred and thirty-eight.

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